

CLAIMS

1. A foil bearing for supporting a rotating member that rotates about an axis, comprising:

5 a stationary mount member spaced from the rotating member so that a gap is defined between the stationary mount member and the rotating member;

a moveable member rotatable about the axis; and

a first foil disposed in the gap between the rotating member and the stationary mount member to support the rotating member via a fluid film when the rotating  
10 member rotates,

wherein the first foil comprises a substantially circumferentially extending portion to which a first magnet is provided;

wherein the moveable member is provided with a second magnet so that a magnetic force between the first magnet and the second magnet can urge the first foil  
15 toward the rotating member; and

wherein an amplitude of the magnetic force can be by rotating the moveable member around the axis to vary a relative circumferential position between the first magnet and the second magnet.

20 2. A foil bearing according to claim 1, comprising a plurality of the first foils arranged in a circumferential direction of the rotating member, and at least one of the plurality of first foils is provided with the first magnet.

3. A foil bearing according to claim 2, wherein each of the first foils is provided  
25 with the first magnet.

4. A foil bearing according to claim 3, wherein the moveable member is provided with a plurality of the second magnets which have varying magnetic strengths.

5 5. A foil bearing according to claim 3, wherein the first magnets provided to the plurality of first foils have varying magnetic strengths.

6. A foil bearing according to claim 2, wherein spaces between adjacent ones of the plurality of first foils are varied.

10

7. A foil bearing according to claim 1, wherein the rotating member comprises a shaft having a substantially cylindrical portion, and the stationary mount member surrounds the shaft so that the gap is formed as an annular gap defined between a cylindrical surface of the cylindrical portion of the shaft and the stationary mount member.

15

8. A foil bearing according to claim 7, wherein the shaft consists of a rotor shaft of a gas turbine engine, and the foil bearing constitutes a journal bearing for the rotor shaft of the gas turbine engine.

20

9. A foil bearing according to claim 7, comprising a plurality of the first foils arranged in a circumferential direction of the shaft, and the foil bearing further comprises a second foil disposed between the shaft and the plurality of first foils and extending in the circumferential direction to have a substantially cylindrical shape.

25

10. A foil bearing according to claim 7, wherein the first foil consists of a single member extending in a circumferential direction to have a substantially cylindrical shape.

5 11. A foil bearing according to claim 1, wherein the rotating member comprises a disk-shaped member and the gap is defined between the stationary mount member and a planar surface of the disk-shaped member.

10 12. A foil bearing according to claim 11, wherein the disk-shaped member is provided as a unitary portion of a rotor shaft of a gas turbine engine, and the foil bearing constitutes a thrust bearing of the rotor shaft of the gas turbine engine.